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I, KAY WARD, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PQ 1044 for a patent by ULTIMATE PRODUCTS (AUST) PTY LTD filed on 21 June 1999.

WITNESS my hand this
Third day of July 2000

K Ward

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AUSTRALIA
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PROVISIONAL SPECIFICATION

LIQUID ALTERNATIVE TO BULK LIME
IN
AGRICULTURAL AND HORTICULTURAL APPLICATIONS

The invention is described in the following statement:



LIQUID ALTERNATIVE TO BULK LIME IN AGRICULTURAL AND HORTICULTURAL APPLICATIONS

This invention relates to improvements in the method of application of agricultural lime.

Many Australian soils are acidic, and CSIRO tests reveal that acidic soils absorb nutrients less readily than those soils with a neutral pH. It is common practice to correct this acidity through the application of agricultural lime, which consists of ground limestone in powdered form. Agricultural lime is powdered to enable it to be absorbed readily into the soil : the finer the lime particles, the more effectively they correct soil acidity.

However, lime is a difficult product to spread because of its dusty character. A brochure from David Mitchell Ltd – a major supplier of lime – states "... whilst it carries no caustic property, it would be advisable for spreading operators to use goggles to prevent the dust blowing into their eyes." Many commercial users of lime engage a contractor to spread it.

The application of lime would be much easier and less dusty if it were not ground into such fine particles, but this would mean that the soil could not absorb the product as readily. The effectiveness of the lime is directly related to the surface area exposed to the soil, and finer particles have a greater surface area than large particles for the same given weight.

Lime particles are commonly of the order of 1mm diameter (1000 micron) or more. Lime is available in finer particle sizes, primarily for non-agricultural uses such as paints and non-abrasive cleaners, but it is extremely difficult to apply to soils because of the difficulties in spreading as outlined above.

Because of its particle size, normal agricultural lime may take 12 months or more to become effective.

Furthermore, bulk lime must be applied at very high rates – commonly about 5 tonnes per hectare in highly acidic soils - and it can be difficult and expensive to spread.

It is also difficult to ensure that all areas of the property receive a uniform application of bulk lime, as the product can blow around in the breeze before settling.

In addition, it is not feasible to apply bulk lime in many situations, as the spreading equipment is too large. In many vineyards, for example, the rows of vines are too close together to allow a large vehicle to have access.

The problems associated with the use of bulk lime to maintain or increase soil pH are overcome by the present invention.

This invention involves the suspension of sufficiently fine calcium carbonate (rock lime) in a liquid such that the liquid can be applied through irrigation, fertigation, boom spray or any other system where water is applied to plants or soil.

It is important to realise that the particle sizes to which this Specification refers are very much finer than in traditional agricultural applications. The fine filters used in commercial watering systems can be as small as 45 micron. In the preferred form of this invention, the maximum particle size is in the order of 25 micron, with an average size of 5 micron. This means that the product can safely be applied through fine filter systems without concern for blockages.

The key inventive step in this invention is that, if sufficiently fine calcium carbonate (rock lime) can be suspended in a liquid, the product can be successfully used by a wide range of commercial users who have previously been unable to apply lime.

In the preferred form of this invention, a suspension agent such as PVA is mixed into water, and about 900 grams of the superfine calcium carbonate (rock lime) per litre of water is blended in. This results in a liquid with a calcium content of about 35%.

The key advantages of this invention are as follows:

- Lime can now be applied by commercial users who have previously been unable to do so, or who have had great difficulty in doing so.
- By using a regulated watering system, the grower can apply a much more accurate dosage of lime to the soil than in the case of bulk lime. This is an important factor for commercial growers, where variations in pH can have a substantial impact on crop productivity.
- The very small particle size results in a much more rapid response than traditional lime.
- The very small particle size also enables a higher content of calcium carbonate to be suspended in a given quantity of liquid than would be the case with larger particles. Therefore the liquid suspension in the present invention can have a higher calcium content.

In a variation of this invention, a soluble fertiliser can be dissolved in the liquid to further assist in improving the growing environment for the plant.

Although the above discussion has related to the commercial use of the invention, its application is not confined to this market : home gardeners will also benefit from its advantages. For example, the product can be diluted in a watering can and applied to the lawn or garden, or directly via a "Ready To Use" hose pack. In both cases, the application of lime is much easier than the spreading of bagged lime.

ABSTRACT

An improvement in the method of application of agricultural lime is disclosed.

This invention involves the suspension of sufficiently fine calcium carbonate (rock lime) in a liquid such that the liquid can be applied through irrigation, fertigation, boom spray or any other system where water is applied to plants or soil, thereby enabling the product to be successfully used by a wide range of commercial users who have previously been unable to apply lime.

It is important to realise that the particle sizes to which this Specification refers are very much finer than in traditional agricultural applications. Exceptionally fine particle sizes are necessary to ensure that the product can be applied through fine filter systems without concern for blockages.